

REMARKS

Status of the Claims:

Claims 1 and 12 are currently amended.

Claims 25-43 are withdrawn as being drawn to a non-elected invention.

Claims 9, 22 and 44-88 are canceled.

As such, claims 1-8, 10-21 and 23-43 are pending in this application.

Applicants acknowledge receipt of the Final Office Action dated February 23, 2010 (hereinafter the 'Final Office Action'). In the Final Office Action, the Examiner: (1) rejects claims 1-8, 10-21 and 23-24 under 35 U.S.C. §112, second paragraph; (2) rejects claims 1-8 and 11 under 35 U.S.C. §103(a) as being unpatentable over *Marelius et al.* (WO 90/15031; hereinafter, '*Marelius*') in view of *Larson* (U.S. Pat. No. 3,586,624; hereinafter, '*Larson*') and *Chynoweth et al.* (U.S. Pat. No. 5,269,634; hereinafter, '*Chynoweth*'); (3) rejects claim 10 under 35 U.S.C. §103(a) as being unpatentable over *Marelius* in view of *Larson* and *Chynoweth* taken further in view of *Young et al.* (U.S. Pat. No. 5,591,635; hereinafter, '*Young*') and *Lynn* (U.S. Pat. No. 3,973,043; hereinafter, '*Lynn*'); (4) rejects claims 12-14, 19-21, 24 and 88 under 35 U.S.C. §103(a) as being unpatentable over *Marelius* in view of *Larson*, *Chynoweth*, *Furuta* (JP 08-245285; hereinafter, '*Furuta*') and *Wildenauer* (U.S. Pat. No. 4,758,344; hereinafter, '*Wildenauer*'); (5) rejects claim 15 under 35 U.S.C. §103(a) as being unpatentable over *Marelius* in view of *Larson*, *Chynoweth*, *Furuta*, and *Wildenauer* taken further in view of *Still* (DE 2057413; hereinafter, '*Still*'); (6) rejects claims 16-18 under 35 U.S.C. §103(a) as being unpatentable over *Marelius* in view of *Larson*, *Chynoweth*, *Furuta* and *Wildenauer* taken further in view of *Smit* (EP 0 673 901; hereinafter, '*Smit*'); and (7) rejects claim 23 under 35 U.S.C. §103(a) as being unpatentable over *Marelius* in view of *Larson*, *Chynoweth*, *Furuta*, *Wildenauer* taken further in view of *Young* and *Lynn*.

I. Claim Rejections Under 35 U.S.C. §112, Second Paragraph

In Sections 3 and 4 of the Final Office Action, claims 1-8, 10-21 and 23-24 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner

states that, “independent claims 1 and 12 recite ‘the system is configured to sequentially subject the biomass to oxidative lime pretreatment and anaerobic fermentation in the formed enclosure.’ However, the metes and bounds of the claim cannot be clearly determined from this claim language.” Accordingly, this claim language is herein removed from independent claims 1 and 12.

II. Claim Rejections Under 35 U.S.C. §103(a)

IIA. Claims 1-8 and 11 are Patentable Over Marelius, Larson and Chynoweth

In Section 7 of the Final Office Action, the Examiner rejects claims 1-8 and 11 under 35 U.S.C. §103(a) as being unpatentable over *Marelius* in view of *Larson* and *Chynoweth*. Applicants traverse this rejection. Claim 1 is an independent claim from which claims 2-8 and 11 directly or indirectly depend.

Claim 1 as amended requires, “a drain pipe *disposed above the water-impermeable bottom liner*,” “a biomass input device operable to deliver biomass over the porous structure to form *a biomass pile separated from the water-impermeable bottom liner by the porous structure*,” and “an air blower and *an air distribution pipe...disposed proximate the porous structure*.” Support for these limitations to claim 1 may be found throughout the specification as filed, for example, in Figure 2 and the description thereof.

Marelius fails to teach a ‘drain pipe disposed above the water-impermeable liner,’ but rather teaches ‘drainage channels provided *in* the support structure.’ In lines 26-27 on page 4, for example, *Marelius* teaches that leaching water exits through drainage channels 4 provided *in* the liquid-impervious support structure 2. As noted in the Abstract of *Marelius*, the liquid-impervious support structure (2) of *Marelius* is provided with at least one drainage channel (4). The drainage channel (4) of *Marelius* is integral to the liquid-impervious support structure (2) of *Marelius*. Thus, *Marelius* fails to teach a drain pipe disposed *above* a water-impermeable bottom liner, as required by instant independent claim 1, as amended. Furthermore, in lines 8-16 on page 6, *Marelius* teaches that:

“the liquid-impermeable support structure will preferably be almost flat, so that the shredded waste material can be disposed on said support structure and the decomposed material removed therefrom with the aid of simple bucket loaders and like machines. However, the

support structure must be configured so that the leaching water generated will flow to a leaching-water channel, from which the leaching water can be carried to a leaching-water reservoir or well.”

In lines 32-35 on page 10, *Marelius* teaches that, “the waste-material bed illustrated in Figure 1 is constructed on smoothed natural ground which slopes toward one or more central drainage channels 4.” One of skill in the art would thus not be motivated to position a drain pipe “above a water-impermeable bottom liner,” as *Marelius* teaches the drainage channel to be within a lowest portion of the liquid-impermeable support structure.

Additionally, claim 1, as amended, requires, “to form ***a biomass pile separated from the water-impermeable bottom liner by the porous structure.***” Contrarily, *Marelius* teaches that (see Abstract of *Marelius*) “the invention is further characterized in that the shredded waste is placed ***on*** a liquid-impervious support structure (2),” and, as mentioned hereinabove, *Marelius* teaches “so that the shredded waste material can be disposed ***on*** said support structure.” In lines 11-12 on page 11, *Marelius* teaches, “decomposable carbon is disposed ***on*** the bottom structure 2 such as to form a waste-material bed.” Bottom structure 2 is the liquid-impervious support structure of *Marelius*. Thus, *Marelius* fails to teach, “a biomass input device operable .. to form ***a biomass pile separated from the water-impermeable bottom liner by the porous structure.***” The waste pile of *Marelius* is positioned directly on the liquid-impervious support structure 2 rather than being separated therefrom by a porous structure. On page 3 of the Final Office Action, the Examiner states that “the reference of *Marelius et al.* discloses...a porous structure (4...supported by the bottom liner (2))” and references page 11, lines 25-30 of *Marelius*. Applicants note that *Marelius* teaches, in lines 25-30 on page 11, that “the leaching-water drainage channel or channels 4 may consist of one or more perforated drainage pipes made of plastic, rubber or like material, disposed in a drainage ditch which is filled with filtering sand, gravel or like filtering material.” The porous material (e.g. gravel) of *Marelius* is a part of the drainage channel or channels 4 which are ***within, not above***, the liquid-impervious support structure 2 of *Marelius*, as noted above, and *Marelius* does not provide for formation of “a biomass pile ***separated from the water-impermeable bottom liner by the porous structure***, as required by instant claim 1, as amended.” Indeed, Applicants submit that *Marelius* fails to teach “a porous structure” as recited in claim 1, said porous structure positioned to separate a water-impermeable bottom liner from a biomass pile.

Larson and *Chynoweth* are not cited to provide the missing limitations, specifically, “a drain pipe ***disposed above the water-impermeable bottom liner,***” and “a biomass input device operable to deliver biomass over the porous structure to form ***a biomass pile separated from the water-impermeable bottom liner by the porous structure,***” and indeed fail to provide the missing limitations. Thus a combination of the cited references fails to teach the invention as claimed in instant independent claim 1, as amended. Applicants thus respectfully request removal of the §103(a) rejection to claim 1 and allowance thereof. As claims 2-8 and 11 depend from claim 1, they carry with them each and every limitation of parent claim 1 and are submitted to be allowable for at least the reasons presented hereinabove with regard to claim 1. Applicants thus also respectfully request removal of the §103(a) rejections to claims 2-8 and 11 and allowance thereof.

Additionally, on page 4 of the Final Office Action, the Examiner notes that, “Claim 1 further differs by reciting that the system includes an air blower and distribution pipe for delivering air to the biomass material.” The Examiner cites *Chynoweth* for the teaching that it is known in the art of anaerobic composting to aerobically treat a waste pile with air when the methane production has been exhausted and states that, “one of skill in the art would have recognized that an air blow(er) and distribution pipe would be required and obvious for the known and expected result of injecting air into the waste material as suggested by the reference to *Chynoweth et al.*” Applicants note that claim 1, as amended requires, “***an air distribution pipe...disposed proximate the porous structure.***” As argued hereinabove, *Marelius* fails to teach a porous structure as recited in claim 1, and thus, one of skill in the art could not combine the teaching of air blowing by *Chynoweth* with *Marelius* to create “***an air distribution pipe...disposed proximate the porous structure,***” as required by instant claim 1, as amended. Thus, the cited references fail to teach another limitation of claim, as amended.

IIB. Claim 10 is Patentable Over Marelius in view of Larson, Chynoweth, Young and Lynn

In Section 8 of the Final Office Action, the Examiner rejects claim 10 under 35 U.S.C. §103(a) as being unpatentable over *Marelius* in view of *Larson* and *Chynoweth* taken further in view of *Young and Lynn*. Applicants traverse this rejection. Claim 1 is an independent claim from which claim 10 depends.

As claim 10 depends from claim 1, claim 10 is submitted to be allowable over the combination of *Marelius*, *Larson* and *Chynoweth* for all the reasons presented in Section IIA hereinabove. *Young* and *Lynn* are not cited by the Examiner to provide the missing limitations and indeed fail to do so.

Furthermore, on page 6 of the Final Office Action, the Examiner states that, “claim 10 differs by reciting that the system includes a gas scrubber for contacting the air delivered to the biomass pile with a lime water slurry so as to remove carbon dioxide from the air.” The Examiner cites *Young* for teaching that it is known in the art of biomass processing to control the carbon dioxide content of the aeration gas using a carbon dioxide scrubber,” and cites *Lynn* for the teaching that it is known in the scrubbing art to employ lime water to remove carbon dioxide from a gas stream. Applicants note that *Young* teaches, in lines 2-8 of column 8, that carbon dioxide removal is via a “vent connected to a valve which is responsive to the carbon dioxide removal activation signal that allows air from inside the enclosure to exit the enclosure and a fresh air intake used to allow replacement air to enter the enclosure when the carbon dioxide level of the air in the enclosure rises above the preselected value.” *Lynn* teaches the use of lime water for the removal of carbon dioxide from methane, ***not from air***, as required in the instant claim 10. Indeed, *Lynn* teaches, in lines 51-56 of column 5, that, “it is important that air be excluded from anaerobic fermentation zone 16 because oxygen is detrimental to the organisms that form methane within the zone and even small amounts of oxygen will materially reduce the amount of methane produced in anaerobic fermentation zone 16.” The vapor *Lynn* sends to scrubber 19 comprises about 70% methane and 30% carbon dioxide on a dry basis (see lines 65-68 in column 5 of *Lynn*). One of skill in the art would thus not be motivated to utilize the lime water scrubber of *Lynn* with the closed ***air*** loop circulation apparatus of *Young*. Claim 10 is thus submitted to be allowable for this reason in addition to the reasons presented with regard to claim 1 in Section IIA hereinabove.

As the combination of the cited references fails to provide the invention as claimed in the instant claim 10, Applicants respectfully request removal of the §103(a) rejection to claim 10 and allowance thereof.

IIC. Claims 12-14, 19-21 and 24 are Patentable Over Marelius, Larson, Chynoweth, Furuta and Wildenauer

In Section 9 of the Final Office Action, the Examiner rejects claims 12-14, 19-21, 24 and 88 under 35 U.S.C. §103(a) as being unpatentable over *Marelius* in view of *Larson, Chynoweth, Furuta and Wildenauer*. Applicants traverse this rejection. Claim 12 is an independent claim from which claims 11-14, 19-21 and 24 either directly or indirectly depend. Claim 88 was canceled in a prior response.

In a parallel manner to the amendments made herein to independent claim 1, claim 12 is amended herein to recite, “a plurality of drain pipes disposed ***above the water-impermeable bottom liner,***” “a conveyor belt operable to deliver biomass ***over*** the porous structure to form a biomass pile ***separated from the water-impermeable bottom liner by the porous structure,***” and “an air blower and an air distribution pipe operable to deliver air to the biomass pile, wherein the air distribution pipe is disposed ***proximate the porous structure.***” Claim 12 is submitted to be allowable over *Marelius, Larson* and *Chynoweth* for at least the reasons presented in Section IIA hereinabove with regard to independent claim 1. *Furuta* and *Wildenauer* are not cited for teaching of the missing limitations, rather *Furuta* is cited for the teaching of the use of a grid-like lattice structure and *Wildenauer* is cited for the teaching of a conveyor belt for introducing the biomass into the enclosure. Accordingly, Applicants submit that claim 12, as amended, is allowable over the cited art for at least the reasons presented in Section IIA hereinabove and Applicants respectfully request removal of the §103(a) rejection to claim 12. As claims 13-14, 19-21 and 24 directly or indirectly depend from independent claim 12, they are submitted to be allowable for at least the reasons provided with regard to independent claim 12. Applicants thus also respectfully request removal of the §103(a) rejections to claims 13-14, 19-21 and 24 and subsequent allowance thereof.

IID. Claim 15 is Patentable Over Marelius, Larson, Chynoweth, Furuta, Wildenauer and Still

In Section 10 of the Final Office Action, the Examiner rejects claim 15 under 35 U.S.C. §103(a) as being unpatentable over *Marelius* in view of *Larson, Chynoweth, Furuta* and

Wildenauer taken further in view of *Still*. Applicants traverse this rejection. Claim 12 is an independent claim from which claim 15 depends.

As claim 15 depends from claim 12, claim 15 is submitted to be allowable over *Marelius* in view of *Larson*, *Chynoweth*, *Furuta* and *Wildenauer* for the reasons presented with regard to independent claim 12 in Section IIC hereinabove. Rather than being cited to provide for the missing limitations of *Marelius*, *Larson*, *Chynoweth*, *Furuta* and *Wildenauer*, the *Still* reference is cited only for the teaching that the cover membrane includes a foam layer. Indeed, *Still* fails to provide the missing limitations discussed in Section IIC hereinabove. Accordingly, Applicants submit that claim 15 is patentable over *Marelius*, *Larson*, *Chynoweth*, *Furuta*, *Wildenauer* and *Still* and respectfully request removal of the §103(a) rejection thereto and allowance thereof.

III. Claims 16-18 are Patentable Over Marelius, Larson, Chynoweth, Furuta, Wildenauer and Smit

In Section 11 of the Final Office Action, the Examiner rejects claims 16-18 under 35 U.S.C. §103(a) as being unpatentable over *Marelius* in view of *Larson*, *Chynoweth*, *Furuta* and *Wildenauer* taken further in view of *Smit*. Applicants traverse this rejection. Claim 12 is an independent claim from which claims 16-18 depend.

As claims 16-18 depend from independent claim 12 and as *Smit* is cited solely for the teaching of a screw conveyor and weir structure so as to extract water from the material to be processed and fails to provide the limitations of “a plurality of drain pipes disposed ***above the water-impermeable bottom liner,***” “a conveyor belt operable to deliver biomass ***over*** the porous structure to form a biomass pile ***separated from the water-impermeable bottom liner by the porous structure,***” and “an air blower and an air distribution pipe operable to deliver air to the biomass pile, wherein the air distribution pipe is disposed ***proximate the porous structure,***” claims 16-18 are submitted to be allowable over *Marelius*, *Larson*, *Chynoweth*, *Furuta*, *Wildenauer* and *Smit* for all the reasons provided with regard to claim 12 in Section IIC hereinabove. Applicants thus respectfully request removal of the §103(a) rejections to claims 16-18 and allowance thereof.

IIF. Claim 23 is Patentable Over Marelius, Larson, Chynoweth, Furuta, Wildenauer, Young and Lynn

In Section 12 of the Final Office Action, the Examiner rejects claim 23 under 35 U.S.C. §103(a) as being unpatentable over *Marelius* in view of *Larson, Chynoweth, Furuta* and *Wildenauer* taken further in view of *Young and Lynn*. Applicants traverse this rejection. Claim 12 is an independent claim from which claim 23 depends.

As claim 23 depends from independent claim 12 and as *Young and Lynn* are not cited for teaching of the missing limitations of *Marelius, Larson, Chynoweth, Furuta* and *Wildenauer* (specifically, “a plurality of drain pipes disposed ***above the water-impermeable bottom liner,***” “a conveyor belt operable to deliver biomass ***over*** the porous structure to form a biomass pile ***separated from the water-impermeable bottom liner by the porous structure,***” and “an air blower and an air distribution pipe operable to deliver air to the biomass pile, wherein the air distribution pipe is disposed ***proximate the porous structure***”), claim 23 is submitted to be allowable over *Marelius, Larson, Chynoweth, Furuta, Wildenauer, Young* and *Lynn* for all the reasons provided with regard to claim 12 in Section IIC hereinabove and with regard to claim 10 in Section IIB hereinabove. Applicants thus respectfully request removal of the §103(a) rejection to claim 23 and allowance thereof.

CONCLUSION

Applicants respectfully request reconsideration and allowance of the pending claims and a timely Notice of Allowance be issued in this case. If the Examiner feels that a telephone conference would expedite the resolution of this case, the Examiner is respectfully requested to contact the undersigned. In the course of the foregoing discussions, Applicants may have at times referred to claim limitations in shorthand fashion, or may have focused on a particular claim element. This discussion should not be interpreted to mean that the other limitations can be ignored or dismissed. The claims must be viewed as a whole, and each limitation of the claims must be considered when determining the patentability of the claims. Moreover, it should be understood that there may be other distinctions between the claims and the prior art that have yet to be raised, but which may be raised in the future.

If any fees are inadvertently omitted or if any additional fees are required or have been overpaid, please appropriately charge or credit those fees to Conley Rose, P.C. Deposit Account Number 03-2769.

Respectfully submitted,

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